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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,000	11/25/2003	Peter L. Collins	2303-18-14	6530

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EXAMINER	
LUCAS, ZACHARIAH	
ART UNIT	PAPER NUMBER
1648	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,000	COLLINS ET AL.	
	Examiner	Art Unit	
	Zachariah Lucas	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10-10-06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-65* is/are pending in the application.

4a) Of the above claim(s) *5-11,15-17,25-27,29-33,37-45 and 49-65* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,12-14,18-24,28,34-36 and 46-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-65 are pending in the application.

Election/Restrictions

2. Applicant's election with traverse of Group I, and the species wherein the heterologous RSV is a bovine RSV, the heterologous protein is the P protein, the modification results in attenuation, the modified protein is the M2-2 protein, and the further modification is the modification of positions E831 and Y1321 in the reply filed on October 10, 2006 is acknowledged. The traversal is on the ground(s) that the process claims should be rejoined with the products upon allowance. This is not found persuasive because it is not drawn to the merits of the restriction requirement. .

The requirement is still deemed proper and is therefore made FINAL.

3. Claims 5-11, 15-17, 25-27, 29-33, 37-45, and 49-65 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions or species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on October 10, 2006.

4. Claims 1-4, 12-14, 18-24, 28, 34-36, and 46-48 are under consideration.

Priority

5. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

the present application does not comprise the required reference to the prior application 09/291,894. It is noted that there is a request in the Transmittal of a New Application form filed on November 25, 2003 to amend the application to provide for this reference. However, this is not an accepted form of amending the application.

Because the claim for priority was recognized in the filing receipt, no Petition for Unintentionally Delayed Claim for Priority is required. However, and amendment to the specification to provide the appropriate reference to the parent application is required in order for the Applicant to gain benefit of the priority claim.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-4, 12-14, 18-24, 28, 34-36, and 46-48 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims read on embodiments of the claimed chimeric RSV wherein the virus comprises a RNA polymerase elongation protein. Thus, the claim as written encompasses a generic class of chimeric RSV virus, each of which may contain any RNA polymerase elongation factor. The specification does not provide adequate written description support for the full scope of these generic claims.

The following quotation from section 2163 of the Manual of Patent Examination Procedure is a brief discussion of what is required in a specification to satisfy the 35 U.S.C. 112 written description requirement for a generic claim covering several distinct inventions:

> The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice..., reduction to drawings..., or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus... See Eli Lilly, 119 F.3d at 1568, 43 USPQ2d at 1406.
>
> A "representative number of species" means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus.

Thus, when a claim covers a genus of inventions the specification must provide written description support for the entire scope of the genus. Support for a genus is generally found where the applicant has provided a number of examples sufficient so that one in the art would recognize from the specification the scope of what is being claimed.

In the present case, the applicant has disclosed only a single example of a RNA polymerase elongation factor- the M2 ORF 1 protein of RSV. See e.g., pages 14, lines 6-9; and page 64, lines 5-22. Although the specification states that a "substantially equivalent transcription elongation factor" may be used instead of the M2 ORF1, neither the description nor the examples in the application provide any indication of what such substantially equivalent factors may be. Without examples, or some identification of the M2 ORF1 structure that is necessary to its operation, one in the art wishing to practice the invention has no indication as to what other proteins may be used in the claimed virus. In view of the lack of description for any RNA polymerase elongation factor other than the M2 ORF1, the claims are rejected for exceeding the scope of descriptive support provided by the specification.

8. Claims 1-4, 12-14, 18-24, 28, 34-36, and 46-48 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an isolated infectious chimeric RSV wherein the virus comprises the M2 (ORF1) RNA polymerase elongation factor, does not reasonably provide enablement for viruses containing any RNA polymerase elongation factor. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

A claim is commensurate in scope with the enablement when the applicant has provided sufficient disclosure to enable one skilled in the art to practice the claimed invention without undue experimentation. In re Wands, 8 USPQ2d 1400, 1404 (CAFC 1988). There must be a "reasonable correlation" between the scope of enablement and the scope of the claims. In re Fisher, 166 U.S.P.Q. 18, 24 (CCPA 1970). Such correlation requires "sufficient disclosure, either through illustrative examples or terminology, to teach those of ordinary skill how to make and how to use the invention as broadly as it is claimed. This means that the disclosure must adequately guide the art worker to determine, without undue experimentation, which species among all those encompassed by the claimed genus possess the disclosed utility." See, In re Vaeck, 20 U.S.P.Q.2d 1438, 1444 (CAFC 1991) No such guidance is provided in the present case.

Both the present application (page 64, lines 3-20), and the art relevant to the claimed invention (see, Collins et al. PNAS 92:11563-11567), indicates that the M2 ORF1 protein is one of the minimal proteins necessary for an infectious RSV. Although the application does state that substantial equivalents of this identified protein may be used (pages 63-64), it does not identify

any characteristic or examples which one of ordinary skill in the art could use as guides to identify such equivalents. Further, the combined teachings of the specification, indicating that only substantial equivalents of the M2 ORF1 protein may be used, and the art, teaching that an operative M2 ORF1 protein is necessary for an operative chimeric RSV (Collins et al., PNAS 92:11563-11567), indicate that only a specific subclass of RNA polymerase elongation factors may be used in the invention. As the application has provides no examples or other indication as to what proteins fall within this subclass, other than the M2 ORF1 protein itself, the application has not provided an enabling disclosure corresponding to the full scope of the rejected claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1, 2, 4, 12, 18, 21, 22-24, 35, 36, and 46-48 are rejected under 35 U.S.C. 103(a) as being obvious over Clarke et al. (U.S. 5,840,520) in view of the teachings of Collins et al. (PNAS 92: 11563-67). These claims read on isolated infectious recombinant RSV particular comprising the N, P, and L proteins, as well as an a RNA polymerase elongation factor, wherein the RSV comprises a chimeric genome including a heterologous gene or gene segment from a different RSV. Claim 2 requires that the heterologous gene is from a different human or non-human RSV. Claim 4 additionally requires that the heterologous gene is the P protein. Claims 12 and 18 require the additional presence of one or more attenuating mutations. Claims 22-24 read

on embodiments wherein the M2-2 protein is deleted. Claim 36 reads on embodiments wherein the RSV particle is a subviral particle- defined in the application as an RSV lacking one or more gene not essential for infectivity (e.g., the M2-2 gene).

Clarke teaches the making of recombinant infectious RSV particles. Cols 42-50. The reference suggests the making of chimeric RSV comprising heterologous RSCV sequences from different RSV genomes. Cols 44 (lines 32-42) and 47 (lines 23-36). Clarke suggests embodiments wherein the RSV includes heterologous RSV sequences from "other strains of RSV of human or animal origin" such as is required by claim 2. See e.g., Col 47, lines 30-32. Further, the reference indicates that superinfection by an RSV B subtype was able to rescue an RSV A genome. The reference thereby indicates that the required RSV proteins of N, P, and L are interchangeable, thereby indicating that any one or more of these proteins could be substituted between the RSV A and B subtypes. Thus, it would have been obvious to those of ordinary skill in the art to make and use chimeric RSV comprising heterologous P proteins from a different RSV. The reference further teaches the introduction of attenuations into the particles such that they may be used in anti-RSV vaccines. Col. 44, lines 23-27. However, the Clarke reference does not teach or suggest the inclusion of an RNA polymerase elongation factor in the viral particle.

Collins teaches that, in addition to the previously indicated N, P, and L proteins, an additional protein, the M2-1 protein (the RSV RNA polymerase elongation factor) is also required for the rescue of the complete RSV genome in the absence of a helper virus. In view of these teachings, it would have been obvious to those of ordinary skill in the art to include this protein in the viral particles described by Clarke so as to result in an operable infective chimeric

virus. The combined teachings of these references therefore render the claimed compositions obvious.

11. Claims 1, 2, 4, 12-14, 18, 19, 21-24, 35, 36, and 46-48 rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke and Collins as applied to claims 1, 2, 4, 12, 18, 21, 22-24, 35, and 46-48 above, and further in view of Murphy et al. (U.S. 5,922,326). Claim 13 reads on embodiments wherein the attenuation includes the modification of the cpts RSV 248. Claims 14 reads on embodiments wherein the attenuations are at positions Gln831 and Tyr1321. These modifications correspond to a combination of the temperature adaptations cpts RSV 248 and 1030, respectively. See e.g., Firestone et al. Virology 225: 419 at 420 left column; and Whitehead et al., J Virol 73: 871, abstract.

The teachings of Clarke and Collins have been described above. As indicated above, these references teach the introduction of attenuating mutations into the rescued RSV particles. However, the reference does not teach or suggest the specific modifications of the 248 or 1030 temperature sensitive phenotypes. An attenuated RSV comprising these attenuating mutations is disclosed by Murphy. See e.g., column 25 (Table 12). It would therefore have been obvious to those of ordinary skill in the art to combine these modifications with those of the Clarke reference to result in an attenuated RSV suitable for use as an anti-RSV vaccine antigen. The combined teachings of these references therefore render the claimed inventions obvious. .

12. Claims 1-4, 12, 18, 21-24, 34, 35, 36, and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke and Collins as applied to claims 1, 2, 12, 18, 21, 22-24, 35, and

46-48 above, and further in view of Wertz et al. (U.S. 5,789,229). Claims 1, 2, 4, 12, 18, 21, 22-24, 35, and 46-48 have been described above. Claim 3 is drawn to embodiments wherein the RSV is a human RSV comprising a sequence from a non-human, esp. a bovine, RSV.

The teachings of Clarke and Collins have also been described above. As indicated above, Clarke teaches embodiments wherein the RSV includes heterologous RSV sequences from "other strains of RSV of human or animal origin." However, the reference does not specifically teach or suggest embodiments wherein the non-human RSV is a bovine RSV.

However, Wertz teaches that bovine RSV was known in the art, and that the bovine RSV encodes proteins corresponding to those found in the human RSV. In view of these teachings, and in view of the suggestion in the Clarke reference to construct the chimeric RSV viruses comprising genes from foreign RSV viruses, it would have been obvious to those of ordinary skill in the art to make the chimeric viruses suggested by Clarke using bovine RSV genes. Those of ordinary skill in the art would have had a reasonable expectation of success based on the teachings of Clarke indicating that the genes of one RSV can rescue another, and the suggesting the making of chimeric particles comprising both human and non-human RSV proteins. Thus, the combined teachings of these references render the claimed inventions obvious.

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 1, 4, 12, 14, 18, 19, 20-24, 28, 35, and 46-48 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, 12, 14, 18, 20-25, 28, and 31-34 of U.S. Patent No. 6,689,367. Although the conflicting claims are not identical, they are not patentably distinct from each other because the patented claims represent a species of the presently rejected claims.

15. Claims 1-4, 12, 14, 18, 19, 20-24, 28, 35, and 46-48 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 6-8, 23-28, 39, 50, 51, 59-61 of U.S. Patent No. 6,713,066 in view of the teachings of Clarke (supra). The copending claims read on the inventions of claims 1-3, 12, 14, 18, 19, 20-24, 28, 35, and 46-48. While the copending claims do not teach or suggest embodiments wherein the bovine gene is a P protein encoding gene, such would have been obvious to those of ordinary skill in the art over the teachings of Clarke as described above. The present claims are therefore rejected for obviousness type double patenting over the copending claims.

16. Claims 1-4, 12-14, 18, 19, 21-24, 28, 34-36, and 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 63, 77, 78, 87-90, 92, 101, 102, 109-111 of copending Application No. 10/934,003 in view of the teachings of Collins (supra). The claims of the copending application describe a species of the presently claimed RSV particles except that they do not teach or suggest embodiments wherein the M2-2 gene has been deleted. However, the copending claims do teach embodiments wherein a gene has been deleted. Further, the teachings of Collins indicate that the M2-2 gene may be deleted from the viral genome and that an M2 gene lacking this ORF is a functional equivalent for a full-length M2 gene. From the combination of the copending claims and the teachings of Collins, those embodiments wherein the M2-2 gene has been deleted would also have been obvious variants from the copending claims. The present claims are therefore rejected for obviousness type double patenting as either anticipated by the copending claims, or rendered obvious by those claims in view of Collins.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

17. Claims 1-4, 12-14, 18-24, 34-36, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 10, 11, 30-37, 46, 47, 57-59, 90, and 91 of copending Application No. 11/033996. Although the conflicting claims are not identical, they are not patentably distinct from each other because the copending claims read on the same chimeric RSV particles.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

18. Claims 1-3 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 11/097,946. Although the conflicting claims are not identical, they are not patentably distinct from each other because the present claims read on the same invention as the copending claim.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

19. Claims 1-4, 12-14, 18-24, 34-36, and 46-48 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 11, 30-37, 46, 47, 57-59 of copending Application No. 11/203620. Although the conflicting claims are not identical, they are not patentably distinct from each other because the present claims read on the same invention as the copending claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

20. No claims are allowed.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachariah Lucas whose telephone number is 571-272-0905. The examiner can normally be reached on Monday-Friday, 8 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Campell can be reached on 571-272-0974. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Z. Lucas
Patent Examiner